# Sexual and Drug-Use Risk Factors for HIV and STDs: A Comparison of Women With and Without Bisexual Experiences

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## ABSTRACT

*Objectives.* This study was done to compare risk factors for HIV/STDs in women who reported having had sex with both men and women and women who reported having had sex with men only.

*Methods.* Female participants in a multisite, randomized HIV/STD prevention study in the Seattle area reported both having had sex with a man in the 3 months before and having at least 1 risk factor for HIV/STDs during the year before the study. Of these women, 38% who reported ever having had sex with a woman were compared with those who reported having had sex with men only.

*Results.* Women who had had sex with both men and women were more likely than women who had had sex with men only to report drug use in the 3 months before the study, a greater lifetime number of male partners, a sex partner who had had sex with a prostitute, an earlier age at sexual debut, and forced sexual contact (*P*<.01 for all comparisons). Women who had had sex with both men and women had a mean of 3.2 of these 5 risk factors, vs 2.1 among women who had had sex with men only (*P*<.001).

*Conclusion.* Women who had had sex with both men and women were more likely than women who had had sex with men only to engage in multiple risk behaviors. Health workers should be aware of bisexual experience among women, since this may be a marker for multiple risk behaviors for HIV/STDs. (*Am J Public Health.* 1999; 89:1841–1846)

In the United States, an increasing proportion of reported AIDS cases occur among women, who represented 16% of all AIDS cases in 1997.[1] AIDS in women is usually attributed to heterosexual contact or injection drug use,[2] and heterosexually acquired HIV is increasing more rapidly among women than among men.[3–6]

Despite fairly extensive studies of HIV infections in bisexual men, as recently reviewed by Doll et al.,[7] few studies have tried to estimate HIV seroprevalence or describe HIV-related risk behavior among women who have had sex with both men and women (WSMW).[8–10] The sentinel survey of risk behavior by the Centers for Disease Control and Prevention (CDC) found that 2.8% of 470 bisexual women were HIV positive and that most bisexual women reported having sex primarily with men.[11] Of 103 bisexual women with reported AIDS in 1989, 79% were also injection drug users.[12] Better understanding of the characteristics and complexity of sexual practices and risk-related behaviors among women, including WSMW, is necessary to guide HIV/STD risk-reduction strategies.

The Women in Group Support (WINGS) project, a 5-year, multisite study of an HIV/STD intervention for women, was designed for women at high risk for HIV and STD infection who were currently engaging in sexual intercourse with men. Unexpectedly, 38% of the women enrolled at the Seattle site of the WINGS project also reported having had sex with other women at some time in their past. We conducted an analysis of the Seattle sample to compare risk-related behaviors of WSMW and women who had had sex with men only (WSMO).

## Methods

### Study Population

From May 1995 through August 1997, participants in the WINGS project were recruited from a variety of sources in the community, including health clinics, STD clinics, community-based organizations, other social service agencies, drug treatment programs, housing projects, newspaper advertisements, and friends and family members.

Eligibility criteria for participation included an age of 18 years or older, local residence for 6 months with plans to stay at least another 12 months, vaginal or anal sex with a man in the previous 3 months, and 1 or more self-reported HIV risk behaviors or risk markers during the previous year. These included history of an STD diagnosis (chlamydial infection, trichomoniasis, syphilis, gonorrhea, pelvic inflammatory disease, hepatitis B or C); injection of illicit drugs; exchanging sex for money or drugs; having 3 or more male sex partners; or having sex with a high-risk male (a male suspected of having sex with prostitutes or other partners in the past year, of injecting illicit drugs, or of being HIV-positive). Women were ineligible if they were HIV-positive or had been participants in another HIV-related study during the past year.

## Screening and Baseline Interviews

Interested women were screened in a 15-minute phone call or an in-person interview to determine eligibility. At screening, women were asked the following question about sex with women: "How many different women would you say you have ever had sex with?"

Women who were eligible for the study were scheduled for a face-to-face interview with a trained interviewer, which typically lasted 60 to 90 minutes. Women received $10 for this interview, which elicited data on numbers of male sex partners; use of birth-control and HIV-prevention methods, including male and female condom use with steady and nonsteady male partners; and alcohol and drug use. To ensure valid data, interviewers reviewed questionnaires and clarified inconsistencies during the interview. An on-site investigator reviewed questionnaires for completeness and logical response patterns.

The study was approved by the University of Washington Human Subjects Division, and informed consent for interviews and participation was obtained from all participants.

## Data Analysis

Data analyses were done with SAS[13] and EGRET[14] software to compare demographic and risk-behavioral data for WSMW and WSMO.

Women who reported ever having had sex with 1 or more women were categorized as WSMW. Separate analyses, comparing only those women who reported 2 or more female sex partners with those who reported none, yielded the same pattern of results as did analyses based on women reporting 1 or more female sex partners. We therefore used the latter criterion in our data analyses.

For continuous variables, we calculated means and medians for WSMW and WSMO and compared them through $t$ tests and Wilcoxon rank sum tests, respectively. We derived $P$ values for categorical variables from $\chi^2$ tests, calculated univariate odds ratios (ORs) and 95% confidence intervals (CIs), and used logistic regression to calculate adjusted ORs and 95% CIs. We included variables that were statistically significant ($P < .05$) by univariate analysis in the final logistic regression model if the association remained significant or if inclusion substantially changed the OR of other variables in the model. For similar highly correlated variables (e.g., number of sex partners in the past year, past 3 months, and past 30 days; or various drug-use questions), the most statistically significant factor was used in the model. Nonsignificant or borderline-significant variables

### TABLE 1—Baseline Characteristics of Women Who Have Had Sex With Men and Women vs Women Who Have Had Sex With Men Only

| | WSMW (n = 101), Mean (Range) or n (%) | WSMO (n = 163), Mean (Range) or n (%) | $P^a$ |
|---|---|---|---|
| Mean age (range) | 33.9 (18, 61) | 32.3 (18, 59) | .2 |
| Race/ethnicity | | | .2 |
| White | 56 (55.4) | 70 (43.2) | |
| Black | 26 (25.7) | 54 (33.3) | |
| Other | 19 (18.8) | 38 (23.5) | |
| Education | | | .2 |
| High school/GED/trade or less | 46 (45.5) | 88 (54.0) | |
| Some college or higher | 55 (54.5) | 75 (46.0) | |
| Marital status | | | .3 |
| Married | 3 (3.0) | 5 (3.1) | |
| Divorced/separated/widowed | 43 (42.6) | 53 (32.7) | |
| Never married | 55 (54.5) | 104 (64.2) | |
| Employed | 34 (33.7) | 55 (33.7) | 1.0 |
| Steady source of financial support | | | .7 |
| Salary | 45 (27.6) | 25 (25.0) | |
| Husband/partner | 8 (4.9) | 8 (8.0) | |
| Public assistance | 82 (50.3) | 46 (46.0) | |
| Other | 23 (14.1) | 18 (18.0) | |
| None | 5 (3.1) | 3 (3.0) | |
| Recruitment source | | | 1.0 |
| Non-STD clinic | 16 (18.2) | 28 (22.2) | |
| STD clinic | 6 (6.8) | 6 (4.8) | |
| Friends/family | 16 (18.2) | 22 (17.5) | |
| Newspaper advertisement | 14 (15.9) | 23 (18.3) | |
| Social services | 16 (18.2) | 20 (15.9) | |
| Drug treatment | 10 (11.4) | 13 (10.3) | |
| Other | 10 (11.4) | 14 (11.1) | |

*Note.* GED = general education diploma; STD = sexually transmitted disease; WSMO = women who have had sex with men only; WSMW = women who have had sex with men and women.
[a] $P$ values for comparison of means were derived from the $t$ test. $P$ values for categorical variables were derived from $\chi^2$ tests.

were added one at a time to check for significance or confounding in the final logistic regression model. Assessment was also done for interactions, but none were found.

On the basis of 5 variables included in the final logistic regression model, we created a risk score summing the number of these 5 risk factors that were reported by each subject. Continuous variables were recoded into yes/no categories for inclusion in the summary risk score, which weighted all risk factors equally. Adjustment for age and race was done in comparing the mean summary scores for WSMW and WSMO. A second summary score was created that included additional risk factors that were significant in the univariate analysis.

## Results

### Study Participants

Table 1 presents demographic characteristics and recruitment sources of the 264 study participants who completed the screening and

baseline components of the WINGS study according to the categories WSMW and WSMO. (When elibible women who did and did not complete baseline components were compared, women who completed baselines were more likely to be older [$P < .0001$] and more educated [$P < .0001$].) One hundred one participants (38.3%) reported being WSMW; of these, 23 reported having had only 1 female partner and 78 reported having had 2 or more female partners. The remaining 163 women are therefore defined as WSMO. WSMW and WSMO did not differ significantly in terms of age, race/ethnicity, level of education, marital status, employment status, or source of financial support. Participants represented a variety of recruitment sources; the percentage recruited from each of the various sources did not differ significantly between WSMW and WSMO.

### Comparisons of WSMW With WSMO

Table 2 shows several sex-related behaviors that differed significantly for WSMW

TABLE 2—Sex-Related Behaviors of Women Who Have Had Sex With Men and Women vs Women Who Have Had Sex With Men Only

| | WSMW (n = 101), n (%) | WSMO (n = 163), n (%) | Odds Ratio (95% CI) | $P^a$ |
|---|---|---|---|---|
| Number of male lifetime partners | | | | |
| Median (range) | 40 (3, >998) | 16 (1, >998) | | <.001 |
| ≤10 | 14 (13.9) | 51 (31.3) | 1 | |
| 11–24 | 18 (17.8) | 53 (32.5) | 1.2 (0.6, 2.7) | |
| 25–49 | 23 (22.8) | 24 (14.7) | 3.5 (1.5, 7.9) | |
| ≥50 | 46 (45.5) | 35 (21.5) | 4.8 (2.3, 10.0) | <.001 |
| Number of male partners in prior 3 months | | | | |
| Median (range) | 2 (1, >998) | 1 (1, 200) | | |
| 1 | 38 (37.6) | 94 (57.7) | 1 | <.001 |
| 2 | 27 (26.7) | 40 (24.5) | 1.7 (0.9, 3.1) | |
| 3+ | 36 (35.6) | 29 (17.8) | 3.1 (1.7, 5.7) | <.001 |
| Number of male partners in prior 30 days | | | | |
| Median (range) | 1 (0, 240) | 1 (0, 100) | | |
| 0 | 12 (11.9) | 24 (14.7) | 1 | .004 |
| 1 | 54 (53.5) | 111 (68.1) | 1.0 (0.5, 2.1) | |
| 2+ | 35 (34.7) | 28 (17.2) | 2.5 (1.1, 5.9) | .005 |
| Median age at first consensual sex (range) | 15 (5, 26) | 16 (11, 26) | 0.8 (0.7, 0.9) | <.001 |
| Forced sexual contact by older person as a child/adolescent | 80 (79.2) | 94 (57.7) | 2.7 (1.5, 4.8) | <.001 |
| Exchanged sex for money or drugs in past year | 30 (29.7) | 29 (17.8) | 2.0 (1.1, 3.5) | .02 |
| Had sex partner in prior year who had had sex with a prostitute in prior year | 42 (41.6) | 33 (20.2) | 2.7 (1.6, 4.8) | <.001 |
| Had sex partner in prior year who had ever injected drugs | 52 (51.5) | 67 (41.4) | 1.5 (0.9, 2.5) | .1 |
| Reported history of past STD or hepatitis[b] | | | | |
| Ever | 87 (86.1) | 129 (79.1) | 1.6 (0.8, 3.2) | .2 |
| Prior year | 35 (34.7) | 53 (32.5) | 1.1 (0.7, 1.9) | .7 |
| Prior 3 months | 15 (14.9) | 24 (14.7) | 1.0 (0.5, 2.0) | 1.0 |

*Note.* CI = confidence interval; STD = sexually transmitted disease; WSMO = women who have had sex with men only; WSMW = women who have had sex with men and women.
[a] $P$ values for comparison of medians were derived from the Wilcoxon rank sum test. $P$ values for categorical variables were derived from $\chi^2$ tests.
[b] Includes genital herpes, genital warts, trichomonas, chlamydial infection, syphilis, gonorrhea, hepatitis B or C, or pelvic inflammatory disease.

and WSMO. Specifically, WSMW reported having had more male sex partners in the preceding 30 days, 3 months, and lifetime. WSMW were much more likely than WSMO to report a lifetime number of 50 or more partners. WSMW had an earlier sexual debut (defined as the first consensual sexual experience) than did WSMO and also were more likely to report that someone had forced them to have sexual contact during their childhood or adolescence. WSMW more often reported exchanging sex for money or drugs in the preceding year and having a male sex partner perceived as having had sex with a prostitute in the prior year. WSMW were more likely to have ever used illicit drugs and to have used such drugs recently than were WSMO, and WMSW had more frequently used such drugs in the 30 days preceding the study (Table 3). When marijuana was excluded, differences in illicit drug use in the month preceding the study remained significant (OR = 2.1; 95% CI = 1.2, 3.5). WSMW were more likely to report injection drug use than were WMSO. The use of alcohol or drugs within 1 hour before sex in the 30 days preceding the study was also reported more often by WSMW.

Participants were asked about condom use with both steady partners (men with whom they had shared an emotional relationship for at least 30 days, such as a boyfriend, lover, or husband) and nonsteady partners. Women with more than 1 current steady partner were asked to report condom use with the partner with whom they had had the most sex, while those with more than 1 nonsteady partner were asked to report condom use with the partner with whom they had most recently had sex. WSMW were significantly less likely than WSMO to report condom use (male or female) with a nonsteady partner in the 30 days preceding the study, but the 2 groups did not differ significantly in terms of condom use with a steady partner in the 30 days preceding the study or in condom use at last intercourse with a steady or nonsteady partner (Table 4).

### Multivariate Analyses

In stratified analyses, we assessed potential confounding of the association between history of sex with women and sexual risk-related behaviors. After stratification for

exchanging sex for drugs or money, we found similar trends for differences in risk factors for WSMW and WSMO, including women who had not exchanged sex for money or drugs. Among subjects who had not exchanged sex for money or drugs, for example, WSMW compared with WSMO were likely to have been younger at sexual debut and to have had more male sex partners in their lifetime and during the 3 months preceding the study; WSMW were also more likely to have used illicit drugs, to have used alcohol or drugs within 1 hour before having sex, and to have experienced forced sexual contact as a child or adolescent. After stratification for experience of forced sexual contact during childhood or adolescence, we found the same differing trends for WSMW and WSMO, including subjects who had not experienced forced childhood sexual contact: WSMW were likely to have been younger at sexual debut, to have had more lifetime male partners, and to have used more injection drugs; WSMW also were more likely to have had a sex partner in the past year who had had sex with a prostitute and to exchange sex for money or drugs.

**TABLE 3—Drug-Related Behaviors of Women Who Have Had Sex With Men and Women vs Women Who Have Had Sex With Men Only**

| | WSMW (n = 101), n (%) | WSMO (n = 163), n (%) | Odds Ratio (95% CI) | $P^a$ |
|---|---|---|---|---|
| Ever used illicit drugs[b] | 96 (95.0) | 134 (82.2) | 4.2 (1.6, 11.1) | .002 |
| Used illicit drugs in prior 3 months | 73 (72.3) | 87 (53.4) | 2.3 (1.3, 3.9) | .002 |
| Used illicit drugs in prior 30 days | 67 (66.3) | 77 (47.2) | 2.2 (1.3, 3.7) | .002 |
| 0 times | 34 (33.7) | 86 (52.8) | 1 | |
| 1–9 times | 29 (28.7) | 41 (25.2) | 1.8 (1.0, 3.3) | |
| 10+ times | 38 (37.6) | 36 (22.1) | 2.7 (1.5, 4.9) | .005 |
| Ever injected illicit drugs | 47 (46.5) | 49 (30.1) | 2.0 (1.2, 3.4) | .007 |
| Injected illicit drugs in prior year | 32 (31.7) | 31 (19.0) | 2.0 (1.1, 3.5) | .02 |
| Used alcohol or drugs within an hour before sex in prior 30 days | 63 (62.4) | 71 (43.6) | 2.1 (1.3, 3.5) | .003 |

*Note.* CI = confidence interval; STD = sexually transmitted disease; WSMO = women who have had sex with men only; WSMW = women who have had sex with men and women.
[a]$P$ values were derived from $\chi^2$ tests.
[b]Includes marijuana, heroin, cocaine, crack, speedball, tranquilizers, amphetamines, or street methadone.

Among women who had never injected illicit drugs, WSMW and WSMO differed significantly in lifetime number of male partners, number of male partners during the 3 months preceding the study, alcohol or drug use within 1 hour before having sex, and forced sexual contact as a child. Furthermore, among women who did not report using illicit drugs during the 3 months preceding the study, WSMW were more likely to have been younger at sexual debut and to have had more male lifetime partners and male partners in the 3 months preceding the study and were more likely to have had a sex partner in the past year who had had sex with a prostitute.

In the final logistic regression model, WSMW were significantly and independently more likely than WSMO to report a higher lifetime number of male partners (e.g., 50 or more vs 10 or fewer partners; OR = 3.2; 95% CI = 1.3, 7.5); drug use during the 3 months preceding the study (OR = 2.5, 95% CI = 1.3, 4.6); an earlier age at sexual debut (OR = 0.8; 95% CI = 0.7, 0.9); forced childhood sexual contact (OR = 2.5; 95% CI = 1.3, 4.9); and a male sex partner in the year preceding the study who had had sex with a prostitute within the prior year (OR = 2.4, 95% CI = 1.3, 4.7). WSMW were also more likely to be White than were WSMO (OR = 2.7; 95% CI = 1.5, 5.1).

We created a summary risk score based on the number of these 5 risk factors or risk markers (other than race) reported by WSMW and WSMO. Number of lifetime male partners was recoded as more or fewer than 25 partners. Age at first sex was recoded as less or more than 15 years (based on the

median). WSMW had a mean risk score of 3.2 of a total score of 5.0, whereas WSMO had a mean score of 2.1 ($P < .001$, adjusted for age and race). Of WSMW, 42% reported 4 or all 5 of the risk factors for which scoring was done, as opposed to only 12% of WSMO; 5% of WSMW reported 0 or 1 risk factor, compared with 34% of WSMO. To focus specifically on risk-related behaviors, we removed childhood sexual abuse and added 3 risk factors found significant in the univariate analysis (exchange of sex for money or drugs, ever having used injection drugs, and having used drugs or alcohol within 1 hour before sex), yielding a score that could range from 0 to 7. WSMW had a mean score of 3.5, compared with 2.2 for WSMO ($P < .001$, adjusted for age and race).

## Discussion

In this study, WSMW were more likely than WSMO to have engaged in various behaviors that put them at risk for HIV and STD infection. This was consistent across most of the risk behaviors examined, confirming much of what has been reported in the limited literature on this topic[10,15,16] (J. E. Mantell et al., unpublished data, 1995).

Although WSMW reported an earlier sexual debut than did WSMO, the resulting 1-year difference in the 2 groups' total years since sexual debut probably contributed little to the higher lifetime number of partners of WSMW. WSMW also reported having had more male partners during both the 30 days and the 3 months preceding the study. Mantell et al. also found that WSMW reported

having had more male sex partners than did WSMO in the 30 days preceding their study (J. E. Mantell et al., unpublished data, 1995), as did Deren et al. in their sample of drug-using women.[17]

In our sample, WSMW more often than WSMO reported having had a male sex partner in the preceding year who had had sex with a prostitute within the prior year; however, some women who answered yes to this item may have considered themselves as the prostitute, making this result more difficult to interpret. Mantell et al. found that WSMW were more likely to have had sex with partners who injected drugs (J. E. Mantell et al., unpublished data, 1995); we found a similar trend in our study. Other studies also suggest that WSMW more often report having sex with HIV-positive partners[15] (J. E. Mantell et al., unpublished data, 1995). We did not confirm this relationship, perhaps because few women (only 13) in our study thought that they had had sex with an HIV-positive male in the year preceding the study.

Our finding that WSMW were more likely than WSMO to use drugs (as measured in terms of several variables) is consistent with data reported in the literature.[10,15] This behavior could put women at risk for HIV infection either directly, through sharing of injection equipment, or indirectly, through impaired sexual decision making. However, our stratified analyses showed increased sexual risk–related behavior even among WSMW who did not report injection drug use. Moore et al. also found that among HIV-infected female injection drug users, WSMW engaged in more sexual risk–related behaviors than did WSMO,[16] suggesting that injection drug use alone may not account for increased sexual risk–related behavior among bisexual women.

Similarly, our subanalysis of women who had never exchanged sex for money or drugs also found riskier behaviors among WSMW, indicating that our finding was not simply confounded by the possibility that women who exchange sex for money or drugs may have sex with women in the context of such exchanges. These results are consistent with those of Bevier et al.[15]

Additionally, our stratified analysis of women who did and those who did not report forced childhood or adolescent sexual contact with an older person showed riskier sexual behavior and a trend toward more injection drug use among WSMW than among WSMO. Thus, forced childhood sexual contact by an older person does not appear to drive all associations of WSMW with risky sexual or drug-using behavior.

While engaging in riskier behavior than WSMO in many other ways, WSMW were

TABLE 4—Condom Use With Steady and Nonsteady Partner by Women Who Have Had Sex With Men and Women vs Women Who Have Had Sex With Men Only

| | WSMW (n = 101), n (%) | WSMO (n = 163), n (%) | $P^a$ |
|---|---|---|---|
| Percentage of time used a condom with steady partner in prior 30 days | | | |
| Mean | 37.1 | 34.7 | |
| Never | 32 (45.7) | 65 (51.6) | .7 |
| Sometimes | 21 (30.0) | 34 (27.0) | |
| Always | 17 (24.3) | 27 (21.4) | .7 |
| Percentage of time used a condom with nonsteady partner in prior 30 days | | | |
| Mean | 54.3 | 76.1 | |
| Never | 12 (33.3) | 6 (16.2) | .03 |
| Sometimes | 9 (25.0) | 6 (16.2) | |
| Always | 15 (41.7) | 25 (67.6) | .08 |
| Used condom last time with steady partner | 29 (59.2) | 48 (48.5) | .2 |
| Used condom last time with nonsteady partner | 36 (67.9) | 44 (74.6) | .4 |

Note. WSMO = women who have had sex with men only; WSMW = women who have had sex with men and women.
$^a$P values for comparison of means were derived from the t test. P values for categorical variables were derived from $\chi^2$ tests.

no less likely than WSMO to use condoms with their steady partners. However, WSMW were less likely than WSMO to report using condoms with nonsteady partners. Mantell et al. found no significant differences in condom use with either type of partner in a sample consisting predominantly of African American and Latino women (J. E. Mantell et al., unpublished data, 1995).

Some previous studies have found differences between WSMW and WSMO in prevalence or history of STD[10,15,17] (J. E. Mantell et al., unpublished data, 1995), whereas others have not (J. Marrazzo, MD, University of Washington, personal communication, 1997). We found no significant difference between our WSMW and WSMO groups in self-reported history of STD, despite the many differences in risk-related behaviors. The self-reports of STD history used in our study may have been considerably less specific and less sensitive than the objective biological outcome measures used in some studies.

We identified 5 risk factors or markers as independently significantly associated with bisexual behavior and found that WSMW reported a higher number of these risk factors overall. Using a second summary score based solely on 7 risk-related behaviors (after removing childhood sexual abuse), we found that significant differences remained between WSMW and WSMO. Overall, this suggests that women who report having had sex with both men and women engage in multiple high-risk behaviors at a greater frequency than

those who report having had sex with men only. These findings may help direct the design of STD prevention programs that could promote screening for same-sex behaviors among women as well as men and could address the specific risk factors found to be more common among WSMW in the present study and other studies.

Because stratified analyses suggest that injection drug use, commercial sex, and forced sexual contact during childhood do not fully account for the higher frequency of multiple risk-related behaviors among WSMW, alternative hypotheses for such behaviors are needed. Some research suggests that sensation seeking may underlie some risky behaviors. Zuckerman has described sensation seeking as "a trait defined by the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences."[18(p37)] On the basis of Zuckerman's work, Kalichman et al. developed a sexual sensation–seeking scale[19] and examined it in gay men. They found that the personality characteristic of sensation seeking predicted high-risk sexual behavior, although they cautioned that HIV risk behavior is complex and cannot be attributed to any single factor.[20] However, Horvath and Zuckerman found no association between measures of sensation seeking and risk-related behavior in women.[21] Although we did not specifically measure sensation seeking, this hypothesis requires explicit examination in future studies, particularly among women.

## Study Limitations and Strengths

In the WINGS project, participants were asked to report the number of women with whom they had ever had sex; they were not asked specific follow-up questions about the recency, frequency, or type of their sexual behavior with other women. However, the consistent differences observed in our study between WSMW and WSMO are noteworthy.

Some studies of risk-related behavior among women have recruited subjects primarily from STD clinics, prisons, and poor inner-city neighborhoods. The generalizability of these studies may therefore be limited.[15,22] Although our population consisted of women who were self-selected, recruitment from multiple sources enhances the generalizability of our findings. Further, WSMW and WSMO did not differ across recruitment categories.

We recruited on the basis of risk-related behaviors, whereas many researchers investigating women's same-sex sexual behaviors have recruited women from sources in which women identify themselves as being homosexual, thus excluding those who identify themselves as heterosexual. We assessed and analyzed risk–related behaviors rather than inquiring about sexual identity, since the latter does not necessarily predict sexual behavior. Some women who identify themselves as lesbians do have sex with men,[8,17,23,24] while others who consider themselves heterosexual report having had sex with other women.[17,25] Other investigators have suggested that future research on WSMW should look beyond sexual identity, asking women specifically about their sexual behaviors and recruiting from a broader pool of women[22] (J. E. Mantell et al., unpublished data, 1995).

Additionally, and in contrast to many prior studies, we stratified the subjects in our study according to injection drug use, forced childhood sexual contact, and commercial sex to identify risk factors independently associated with WSMW.

## Conclusion

Our study population of women who engaged in sex with men included a surprisingly high percentage of women who also reported a history of sex with women. We conclude that it is essential not to make assumptions about women's sexual behaviors on the basis of their perceived or stated sexual identity, especially when tailoring prevention messages. Within a population of women at risk for STD and HIV infection, women who have sex with both men and women may represent an overlooked or hid-

den subset. Women who have sex with other women have been viewed by health providers, by prevention workers, and even by themselves as being at lower risk for STDs and HIV than women who have sex with men only.

Our findings corroborate the finding that WSMW are more likely than WSMO to engage in various high-risk behaviors. Moreover, WSMW in our sample were more likely than WSMO to engage in a greater number of risk-related behaviors, suggesting that in some cases, having sex with both men and women could be tied to a pattern of sensation-seeking behavior. Health care workers should recognize that women's reporting of sex with both men and women may be indicative of multiple risk-related behaviors for HIV and STD infection. □

## Contributors

All authors contributed to the conception, design, analysis, and writing of the paper. V. Gonzales planned the study design, coordinated the writing team, and worked closely with all of the other authors. K. M. Washienko and M. R. Krone wrote the methods, results, and parts of the discussion sections. M. R. Krone also performed the data analysis. L. I. Chapman, H. J. Huckeba, E. M. Arredondo, A. Downer, and V. Gonzales worked on the introduction, background, purpose, and discussion. V. Gonzales, K. M. Washienko, and A. Downer were also involved in writing the conclusions and recommendations.

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